

Claims 24-25, 28-29, 32, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 24-25, 28-29, 32, are dependent from canceled claims 2-3.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-8, 10, 14-15, 24-32, are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 6651433 (George, Jr.) in view of U.S. 6579080 (Spinnler).

George, Jr. discloses a system using waste heat from an internal combustion engine 10 for driving a bottoming Brayton system including a compressor 11, an expander 12 connected to a drive shaft 13. George, Jr. does not disclose the compressor and expander are scroll type with common orbital scroll. Spinnler is relied upon to disclose it's well known to have both scroll compressor having chamber 11a and a scroll expander having chamber 11b with the same orbital scroll formed by a disk 2 with spiral scroll 3a, 3b. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the scroll compressor/expander in Spinnler in place of the compressor/expander of George, Jr. for the purpose of achieving a compact structure and because the compressors/expanders are functionally equivalent.

Regarding claim 14, it would have been obvious to select the specific material as claimed for the purpose of achieving appropriate heat.

Claims 19, 21, are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. 6651433 (George, Jr.) in view of U.S. 6579080 (Spinnler) and US 7076963 (Higashiyama). George, Jr. as modified by Spinnler discloses all the claimed subject matter as set forth above in the rejection of claim 1, but does not disclose a through hole formed in the orbital portion. Higashiyama is relied upon to disclose it's well known to provide a communication hole 30, 31 in the partition disk. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide holes in the orbital disk in George, Jr. (added from Spinnler) to have a through hole as taught by Higashiyama for the purpose of allowing the fluid communication between both sides of the disk.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mori et al disclose a scroll device having common orbital scroll, a compressor section at one side and an expander section at the other side.

Art Unit: 3748

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Examiner Nguyen whose telephone number is (571) 272-4861. The examiner can normally be reached on Tuesday--Friday from 12:30 AM to 10:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on 571-272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Hoang M Nguyen/
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ART UNIT 3748

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